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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/607,024	EID ET AL.
	Examiner	Art Unit
	Con P. Tran	2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 June 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 12, and 23 are objected to because of the following informalities:

Legend for "RSurl" in the equations missing;

It appears there is a typographical error in the equation:

"-0.38xRSurl" should be "+0.38xRSurl". For purpose of examining,

Examiner assumes Applicants intend to claim "+0.38xRSurl".

Claim 6 is objected to because of the following informalities: Claim 6 states "at

least one of the input signal pairs . . . comprises . . ., . . ., *and* a front input signal pair."

Such information of the Claim 6 could not be found in the specification. Actually, the

specification discloses in page 26, lines 11-19: "four pairs of input signals including, a

rear input pair RIP, a side input pair SIP, a front input pair FIP and a steering angle

input pair SAIP",   For purpose of examining, Examiner assumes Applicants intend to

claim "at least one of the input signal pairs . . . comprises . . ., . . ., *or* a front input signal

pair."

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   **Claims 3 and 29** are rejected under 35 U.S.C. 102(e) as being anticipated by

Gerzon et al. U.S. Patent 5,757,927 (hereinafter, "Gerzon").

Regarding **claim 3**, Gerzon teaches a surround processing system (surround

sound decoders and reproduction systems; see Figs. 1, 10, and respective portions of

the specification; col. 1, lines 7-12), comprising:

a multi-channel matrix decoder module (e.g., low frequency decoding

matrix 22, Fig. 10; col. 4, lines 28-35; see Figs. 1, 10, 13, and respective portions of the

specification) that produces a plurality of output signals (7, Fig. 1; C_F, S_C, M_F, S_F, M_B,

S_B, Figs. 6-10, 13; col. 9, lines 21-22; col. 14, lines 43-56; col. 15, lines 31-34); and

an adjustment module (i.e., intermediary amplifier and signal transmission

stages, col. 7, lines 39-49) that produces a plurality of adjusted output signals, the

adjustment module comprising a gain module, an equalizer module and a delay module

(i.e., corporate overall gain or equalization adjustments affecting all signal paths equally,

and also any gain, time delay or equalization adjustment; col. 7, lines 39-49).

Regarding **claim 29**, Gerzon teaches a surround processing system of Claim 3,

where the plurality of output signals comprises a first number (three: W_d, X_d, Y_d, Figs.

12, 13; col. 22, lines 10-22)

where the plurality of adjusted output signals comprise a second number

(four: L_F, R_F, L_B, R_B; outputs Fig. 13; col. 22, lines 10-22, lines 34-42) and

where the second number (four) is greater than the first number (three;

see Figs. 12, 13).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   **Claims 1, 2, 5, 7, 16, and 18** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Davis U.S. Patent 5,862,228 in view of Admitted Prior Art

(hereinafter, "APA").

Regarding **claim 1**, Davis teaches a multi-channel matrix decoder module (Fig.

3; col. 4, lines 32-47) for generating a plurality of audio output signals (to audio

reproducing transducers) from a plurality of audio input signals (Lt, Rt), the audio output

signals for generating sound waves in an environment (to audio transducers, not

shown), the decoder module, comprising:

an input mixer (linear mixer 102, Fig. 3) that produces an input signal pair

(Lt', Rt') using the plurality of audio input signals (Lt, Rt, Lt1/Rt1 through Ltn/Rtn) each

of the plurality of the input signal pairs (Lt, Rt, Lt1/Rt1 through Ltn/Rtn) being non-

inverses of one another (e.g., linear mixer) and directed to different locations in the

environment (to audio transducers, not shown; col. 4, lines 32-47); and

a matrix decoder (matrix decoder 104, Fig. 3) coupled to the input mixer

(linear mixer 102, see Fig. 3), and outputting output signals for the location correlated to

the input signal pair received (left, right, center; see Fig. 6).

Davis further discloses may be used the encoder with one or more other virtual

encoder (i.e., providing more input pairs, other than Lt and Rt, to mixer 102 in Fig. 3;

col. 3, lines 40-46). Davis does not explicitly specify an input mixer produces a plurality

of input signal pairs. However, it would have been obvious to one having ordinary skill in

the art at the time the invention was made to produce the plurality of input signal pairs

by duplicating the mixer such that to obtain the plurality of input signal pairs for multiple

effect. In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960).

Davis does not explicitly specify the matrix decoder comprising different sections

directed to the different locations, each of the sections receiving input from one of the

input signal pairs and outputting output signals for the location correlated to the input

signal pair received that produces a plurality of output signals as a function of the input

signal pairs.

APA disclose "an input signal pair may be created for use by known matrix

decoding techniques determining one or more steering angles (the "steering angle input

pair" or "SAIP")," see Specification, page 22; and "The matrix decoder 736 may be a

known active matrix decoder such as LOGIC 7® , DOLBY PRO LOGIC®, or the like."

See Specification, page 26; Figure 7.

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have incorporated the matrix decoder by APA with the multi-

channel matrix decoder module of Davis such that the matrix decoder comprising

different sections directed to the different locations, each of the sections receiving input

from one of the input signal pairs and outputting output signals for the location

correlated to the input signal pair received that produces a plurality of output signals as

a function of the input signal pairs as claim for purpose of providing a totally user-

generated soundfield, as suggested by Davis in column 3, lines 45-46.

Regarding **claim 2**, this claim merely reflects the method to the apparatus claim

of claim 1 and is therefore rejected for the same reasons.

Regarding **claim 5**, Claim 5 is also meet in view of the above discussion in Claim

1.

Regarding **claim 7**, Claim 7 is also meet in view of the above discussion in Claim

1.

Regarding **claim 16**, this claim merely reflects the method to the apparatus claim of claim 5 and is therefore rejected for the same reasons.

Regarding **claim 18**, this claim merely reflects the method to the apparatus claim of claim 7 and is therefore rejected for the same reasons.

6.   **Claims 6, 8-15, 17, and 19-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis U.S. Patent 5,862,228 in view of Admitted Prior Art (hereinafter, "APA"), and further in view of Griesinger U.S. Patent 5,787,480.

Regarding **claim 6**, Davis in view of APA teaches a decoder module of claim 1. However, Davis in view of APA does not explicitly disclose where at least one of the input signal pairs produced by the input mixer comprises a rear input signal pair, a side input signal pair, or a front input signal pair.

Griesinger discloses a multichannel active matrix decoder (see Title) in which the input pairs input at active matrix decoder (90, Fig. 4; col. 20, lines 21-26) including five discrete inputs LS, L, C, R, and RS (col. 12, lines 37-44, Fig. 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have incorporated the multichannel active matrix decoder taught by Griesinger with the decoder module of Davis in view of APA such that at least one of the input signal pairs produced by the input mixer comprises a rear input signal pair, a

side input signal pair, or a front input signal pair in order to optimize its psychoacoustic

performance, as suggested by Griesinger in column 3, lines 39-41.

Regarding **claim 8**, Davis in view of APA teaches a decoder module of claim 7.

However, Davis in view of APA does not explicitly disclose where the plurality of audio

input signals comprises a left-front, a right-front, a left-surround, a right-surround, and a

center input signal, and producing the steering angle input pair comprises converting

the left-front, the right-front, the left-surround, the right-surround, and the center input

signals into the steering angle input pair.

Griesinger discloses a multichannel active matrix decoder (see Title) where the

plurality of audio input signals comprises a left-front, a right-front, a left-surround, a

right-surround, and a center input signal (L, R, LS, RS, and C, respectively; col. 12,

lines 37-44, Fig. 3), and producing the steering angle (θ_{RS}, θ_{LS}; control signal and

steering angles; Figs. 9, 10, col. 6, lines 8-16; col. 11, lines 8-12) input pair comprises

converting the left-front, the right-front, the left-surround, the right-surround, and the

center input signals into the steering angle input pair (based on l/r, c/s Fig. 4, col. 20,

lines 21-26, lines 53-65; col. 14, lines 23-36; col. 16, lines 11-20; col. 22, lines 46-58;

col. 23, lines 58-65; col. 25, lines 18-29; col. 26, lines 27-33).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have incorporated the multichannel active matrix decoder taught

by Griesinger with the decoder module of Davis in view of APA such that where the

plurality of audio input signals comprises a left-front, a right-front, a left-surround, a

right-surround, and a center input signal, and producing the steering angle input pair

comprises converting the left-front, the right-front, the left-surround, the right-surround,

and the center input signals into the steering angle input pair as claimed in order to

optimize its psychoacoustic performance, as suggested by Griesinger in column 3, lines

39-41.

Regarding **claim 9**, Davis in view of APA teaches a decoder module of claim 1.

However, Davis in view of APA does not explicitly disclose where input to each of the

sections for the different locations of the matrix decoder consists of the input signal pair

received for the different locations and steering angle input.

Griesinger discloses a multichannel active matrix decoder (see Title) in which

input to each of the sections for the different locations of the matrix decoder consists of

the input signal pair received for the different locations and steering angle input (col. 4,

lines 11-19; to speakers of channels L, R, LS, RS, and C; col. 12, lines 37-44, Figs. 3,

4).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have incorporated the multichannel active matrix decoder taught

by Griesinger with the decoder module of Davis in view of APA such that where input to

each of the sections for the different locations of the matrix decoder consists of the input

signal pair received for the different locations and steering angle input as claimed in

order to optimize its psychoacoustic performance, as suggested by Griesinger in

column 3, lines 39-41.

Regarding **claim 10**, Davis in view of APA teaches a decoder module of claim 1.

However, Davis in view of APA does not explicitly disclose where the sections of the

matrix decoder comprises a plurality of submatrices, each submatrix receiving input

from one of the plurality of input signal pairs.

Griesinger discloses a multichannel active matrix decoder (see Title) in which

the sections of the matrix decoder comprises a plurality of submatrices (in matrix

elements section, Fig. 4), each submatrix receiving input from one of the plurality of

input signal pairs (col. 4, lines 11-19; encoded signals of channels of Fig. 3; col. 12,

lines 37-44, see Figs. 3, 4).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have incorporated the multichannel active matrix decoder taught

by Griesinger with the decoder module of Davis in view of APA such that where the

sections of the matrix decoder comprises a plurality of submatrices, each submatrix

receiving input from one of the plurality of input signal pairs as claimed in order to

optimize its psychoacoustic performance, as suggested by Griesinger in column 3, lines

39-41.

Regarding **claim 11**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 10. Griesinger, as modified, further teaches where

the input mixer produces a rear input signal pair (col. 12, lines 37-44, Figs. 3, 4); and

where one of the plurality of submatrices comprises a rear submatrix that inputs the rear

input signal pair (152, 154, 156, 158, Fig. 4) and produces a plurality of rear output

signals as a function of the rear input signal pair (LS, 178; RS, 180, Fig. 4).

Regarding **claim 12**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 11. Griesinger, as modified, further teaches in Fig.

6c, curves J and K represent the values of the coefficients LSL and LSR respectively as

the ratio l/r goes from 0 dB (no steering or center steering) to 33 dB, representing full

left steering; there is a break point at 8 dB, corresponding to a steering angle of $22°$ to

the rear, and this is achieved if they have values of cos $22°$ or 0.92 and sin $22°$ or 0.38,

as can be seen from the curves (Fig. 6, col. 22, lines 46-58). In addition, Griesinger

discloses:

Right rear/side output=RSL cos(ts) + RSR sin(ts) = 0   (col. 17, equation

69);

and

Left output (A)=L+0.707C-0.707jS   (col. 11, equation 17, Fig. 3).

Thus,

Left output (A)=L+(0.707C-0.707jS)+ RSL cos(ts)+RSR sin(ts);

at ts=22.5°

Left output (A)=L+(0.707C-0.707jS)+ RSL (0.9)+RSR (0.38)

or

Left output (A)=L+ (0.9)RSL +(0.38)RSR +(0.707C-0.707jS)

where

Left output (A) becomes an encoded signal of five channel outputs. Left
output (A) inputs to five channel decoder (90, Fig. 3), and the decoder provides seven
channel outputs (col. 20, lines 1-5).

However, Davis in view of APA and further in view of Griesinger does not
explicitly discloses where at least one of the signals in the rear input signal pair is
produced by the input mixer according to an equation:

$$RI1=LF1+0.9xLSurl-0.38xRSurl+GrxCTRI,$$

where Gr comprises a ratio with the center input signal to control the amount of
the center input signal in the rear input signal pair,

LFI comprises a left-front input signal,

LSurl comprises a left-surround input signal, and

CTRI comprises a center input signal.

Nevertheless, such implementation is well known in the art. (Official notice
taken).

It would have been obvious to one of ordinary skill in the art at the time the
invention was made to have implement the decoder module taught by Davis in view of
APA and further in view of Griesinge such that where at least one of the signals in the
rear input signal pair is produced by the input mixer according to an equation as claimed
in order to optimize its psychoacoustic performance, as suggested by Griesinger in
column 3, lines 39-41.

Regarding **claim 13**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 11. Griesinger, as modified, further teaches where

at least some of the plurality of audio input signals comprise the same locations (Left,

Right inputs, Fig. 4) as at least some of the plurality of audio output signals (L, R

outputs, Fig. 4; col. 20, lines 1-10).

Regarding **claim 14**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 11. Griesinger, as modified, further teaches where

the at least some of the plurality of audio input signals comprise a left-front input signal

and a right-front input signal (Left, Right inputs, Fig. 4; col. 20, lines 1-10, lines 21-26);

and

where the at least some of the plurality of audio output signals comprise a left-

front output signal and a right-front output signal (L, R outputs, Fig. 4; col. 20, lines 1-10,

lines 21-26).

Regarding **claim 15**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 11. Griesinger, as modified, further teaches where

the at least some of the plurality of audio input signals comprises a center input signal

(i.e., output C from encoder of Fig. 3, see col. 20, lines 21-26; Fig, 4; col. 20, lines 1-10);

and

where the at least some of the plurality of audio output signals comprise a

center output signal (see col. 20, lines 21-26; Fig, 4; col. 20, lines 1-10).

Regarding **claims 17, 19-23, 26-28** these claims merely reflect the method to the

apparatus claim of **claims 6, 8-15**, respectively and are therefore rejected for the same

reasons.

Regarding **claim 24**, Davis in view of APA teaches a decoder module of claim 2.

However, Davis in view of APA does not explicitly disclose further comprising producing

an additional audio output signal as a function of one or more of the plurality of audio

output signals.

Griesinger discloses a multichannel active matrix decoder (see Title) in which the

input pairs input at active matrix decoder (90, Fig. 4; col. 20, lines 21-26) including five

discrete inputs LS, L, C, R, and RS (col. 12, lines 37-44, Fig. 3); and producing an

additional audio output signal as a function of one or more of the plurality of audio

output signals (i.e. seven channels including left side and right side outputs, col. 20,

lines 1-10).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have incorporated the multichannel active matrix decoder taught

by Griesinger with the decoder module of Davis in view of APA such that producing an

additional audio output signal as a function of one or more of the plurality of audio

output signals as claimed in order to optimize its psychoacoustic performance, as

suggested by Griesinger in column 3, lines 39-41.

Regarding **claim 25**, Davis in view of APA and further in view of Griesinger

teaches a decoder module of claim 24. Griesinger, as modified, further teaches where

the plurality of audio output signals comprises a side output signal (i.e. seven channels

including left side and right side outputs, col. 20, lines 1-10); and

where producing an additional audio output signal comprises producing an

additional side output signal (i.e. seven channels including left side and right side

outputs, col. 20, lines 1-10).

7.   **Claims 30-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gerzon et al. U.S. Patent 5,757,927 (hereinafter, "Gerzon") in view of Griesinger U.S.

Patent 5,787,480.

Regarding **claim 30**, Gerzon teaches a surround processing system of Claim 29,

where the gain module comprises a plurality of gain units (amplifier 3, Fig.1), a number

of the plurality of gain units (3) equal to the second number for the plurality of adjusted

output signals (see Fig. 1; col. 9, lines 33-42).

However, Gerzon does not explicitly disclose where at least one of the plurality of

output signals is coupled to more than one gain unit.

Griesinger discloses a multichannel active matrix decoder (see Title) in which in

the seven channel version of the decoder, circuit elements 152-158, 166, 168, and 170

are duplicated, being fed from the same point as their corresponding elements shown in

Fig. 4.

It would have been obvious to one of ordinary skill in the art at the time the

invention was made when facing the design need of increasing the number of output

signals to have incorporated the multichannel active matrix decoder taught by

Griesinger with the decoder module of Gerzon to obtain at least one of the plurality of

output signals is coupled to more than one gain unit as claimed in order to optimize its

psychoacoustic performance, as suggested by Griesinger in column 3, lines 39-41.

Regarding **claim 31**, Gerzon in view of Griesinger Gerzon teaches a surround

processing system of Claim 30. Griesinger Gerzon, as modified, further teaches where

the equalizer module comprises a plurality of equalizer units; and where outputs of the

gain units are coupled to a corresponding equalizer unit an adjustment module (i.e.,

using intermediary amplifier and signal transmission stages which may corporate overall

gain or equalization adjustments affecting all signal paths equally, and also any gain,

time delay or equalization adjustment col. 7, lines 39-49).

Regarding **claim 32**, Gerzon in view of Griesinger Gerzon teaches a surround

processing system of Claim 30. Griesinger Gerzon, as modified, further teaches where

the delay module comprises a plurality of delay units; and where outputs of the

equalizer units are coupled to a corresponding delay unit (i.e., corporate overall gain or

equalization adjustments affecting all signal paths equally, and also any gain, time delay

or equalization adjustment; col. 7, lines 39-49).

Response to Arguments

8.   Applicant's arguments with respect to claims 1-3, and 5-32 have been considered but are moot in view of the new grounds of rejection.

Conclusion

9.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Con P. Tran whose telephone number is (571) 272-7532. The examiner can normally be reached on M - F (8:30 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor Vivian C. Chin can be reached on (571) 272-7848. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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cpt   CPJ
August 28, 2007

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